

## CLAIMS

1. Composite sandwich plate-like construction, comprising a tension plate, a contact layer and a compression layer, said compression layer being an inorganic layer at least comprising ultra fine particles and a binder.

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2. Construction according to claim 1, characterised in that the inorganic layer encapsulates a reinforcement, said reinforcement being steel bars or rods, carbon-, glass-, plastic and/or steel fibres.

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3. Construction according to claim 2, characterised in that the reinforcement bars or rods constitutes 3 % to 60 % by weight of the inorganic layer, more preferred 5 % to 35 % by weight of the inorganic layer, and most preferred 6 % to 20 % by weight of the inorganic layer.

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4. Construction according to claim 2, characterised in that the fibre content constitutes 1 % to 35 % by weight of the inorganic layer, more preferred 1 % to 20 % by weight of the inorganic layer, and most preferred 2 % to 12 % by weight of the inorganic layer.

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5. Construction according to claim 1, characterised in that the inorganic layer comprises a coarse graded aggregate having an aggregate size between 1 mm and 22 mm, more preferred 2 mm and 16 mm and most preferred 2 mm and 8 mm and that the grading is in intervals having grain sizes 2 - 5 mm, 3 - 6 mm, 5 - 8 mm and/or 8 - 11 mm.

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6. Construction according to claim 1 and/or claim 5, characterised in that the inorganic layer comprises a coarse aggregate constituting 20 % to 75 % by weight of the inorganic layer, more preferred 30 % to 65 % and most preferred 35 % to 55 % by weight of the inorganic layer, and that the aggregate is chosen from or as a combination of basalt, granite, bauxite, korund or similar strong types of aggregates.

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7. Construction according to claim 1, characterised in that the inorganic layer comprises in addition to the binder a fine aggregate fraction, having particles between

0 mm and 4 mm, more preferred particles between 0 mm and 2 mm, and that the fine aggregate fraction comprises one or more of the following: silica sand, river sand, calcium filler, bauxite or other aggregates of good quality.

5      8. Construction according to any of the preceding claims, characterised in that the water/binder ratio is between 0.15 and 0.45 more preferred between 0.20 and 0.40 and most preferred between 0.25 and 0.35.

10     9. Construction according to any of the preceding claims, characterised in that the binder is cement, a combination of cement and micro silica, and that the cement is preferably white cement.

15     10. Construction according to any of the preceding claims, characterised in that air content adjusting additives and/or super-plasticizers or other water reducing agents are added to the inorganic layer during its dry powder or wet mixing state.

20     11. Construction according to any of the preceding claims, characterised in that the contact layer comprises an epoxy-based material or contact glue with similar bonding strength having a layer thickness between 0,2 mm and 5 mm, more preferred between 0,5 mm and 3,5 mm and most preferred between 0,7 mm and 2,5 mm, and that said layer comprises rock particles having a size between 0,5 mm to 8 mm, preferably 1 mm to 6 mm, most preferred 2 mm to 6 mm and that the rock is chosen from bauxite, quartz, granite or similar types of strong aggregates.

25     12. Construction according to any of the preceding claims, characterised in that the inorganic material layer has a thickness between 5 mm and 150 mm, more preferred between 10 mm and 110 mm and most preferred between 15 mm and 85 mm.

30     13. Construction according to any of the preceding claims, characterised in that the steel plate is a bridge deck, ship deck, oil platform, windmill foundation or tower or other off shore facility, staircase, balcony carpark deck or other load carrying

steel structure, protective barrier, construction element, floorboard, furniture plate or ship hull.

14. Method for making a construction as claimed in any of claims 1 to 10, wherein

- 5 a) a steel plate is placed horizontal or vertical;
- b) optionally the steel plates surface is cleaned for example by a sandblasting process;
- c) an epoxy-based or other contact glue with similar bonding strength as contact layer is applied to the steel plates surface in a thickness of 0.3 to 5 mm;
- 10 d) while the epoxy-based contact layer is still wet rock particles having a size between 0,5 mm to 8 mm, preferably 1 mm to 6 mm and that said rock particles are chosen from bauxite, quartz, granite or similar strong aggregates are distributed on the contact layers surface;
- e) an inorganic material comprising a binder, fine and coarse aggregate is cast on
- 15 the surface of the epoxy-based contact layer, optionally wet-in-wet;
- f) the construction is allowed to cure.

15. Method according to claim 14, wherein before step e) the epoxy-based contact layer is allowed to cure/harden, and that reinforcement bars or rods are arranged on

20 said contact layer.

16. Method according to claim 14 or 15, wherein the inorganic material comprises fibre reinforcement.

25 17. Method according to any of claims 14 to 16, wherein the reinforcement bars or rods are connected to the steel plate through the epoxy-based contact layer by means of steel anchors.

18. Method according to any of claims 14 to 17, wherein a curing membrane is installed covering the inorganic material layer.

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19. Method according to any of claims 14 to 18, wherein the inorganic material comprises:

- 25 to 50 kg high strength binder based on cement preferably white cement;
- 30 to 50 kg sand, quartz and/or bauxite having a particle size between 0 mm and 2 mm;
- 25 to 75 kg aggregate, having particle sizes between 2 mm and 8 mm;
- 5 - a fibre content of less than 20 %;
- and a water/cement ratio between 0.15 and 0.40 by weight;
- and optionally air void regulating substances, super-plasticizers, or other additives.